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ABSTRACT

A three year project designed to determine the value of a health program incorporating a cardiopulmonary fitness program is described. The instructional programs were in heart health, pulmonary health, nutrition, and physical fitness. A noncompetitive exercise and fitness period was employed in addition to the normal physical education time. Parents and teachers also participated in the program. Fitness assessments were given at the beginning of each school year and again at the end. Results indicate that this program improved the health of the participating children by lowering cholesterol levels, blood pressure, and resting heart rate while increasing physical endurance. (JD)

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THE SUNFLOWER CARDIOPULMONARY RESEARCH PROJECT OF CHILDREN

by

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The "Sunflower Project" is a three-year pilot project designed to promote better cardiopulmonary health and to project a positive lifestyle for elementary school children, their parents, and teachers. The project has now been completed.

The project was conducted by state and local health agencies. These agencies were the University of Kansas Department of Health, Physical Education, and Recreation, the University of Kansas Medical School, the Shawnee Mission Kansas School District, the American Heart Association (Kansas Affiliate) and the American Lung Association (Kansas Affiliate).

The project was designed to experiment with and to determine the value of a new health program and a cardiopulmonary fitness program. Physiological and cognitive assessments were conducted on a pre and post treatment basis for comparative purposes. Two different elementary schools were involved in the project. One school served as a control, and the other served as an experimental school. Figure 1 shows the project design.

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Figure 1

Project Design

Experimental School		Control School
400	Enrollment	325
All students	Treatment Phase	No treatment
250	Testing Phase	150
K-6	Grades	K-6
80 min/week	P. E. Time	80 min/week
60 min/week	Fitness Time	None
Modules	Classroom Activities	Regular Health

The experimental instructional programs of the project were in heart health, pulmonary health, nutrition and physical fitness. Classroom modules were developed for each area and in addition to the classroom experiences, a recess period was changed to a fitness break. All children in the experimental school received three 20-minute fitness breaks per week. This was beyond the regularly scheduled 80 minutes of physical education per week. The fitness break was designed for all children regardless of physical capabilities. The most basic goal of each fitness break was to keep the children moving continuously for 20 minutes.

The long range goals of the fitness breaks were as follows:

1. To change the child's attitude in a positive direction toward aerobic activity.
2. Demonstrate how fitness activities can be fun and for lifetime enjoyment.
3. Help the child learn how to maintain an individual fitness level.
4. Demonstrate how fitness levels can be attained by progressing at

one's own rate and in an environment where competition is not stressed.

5. Fitness levels can be attained without arbitrary standards.
6. Fitness activities are for the entire family.
7. Good fitness can be maintained through participation in a variety of activities.
8. To demonstrate that a child can develop good fitness habits without striving for athletic excellence.
9. Help children understand and utilize sound principles for an individual progressive aerobic fitness program.

The objectives of the fitness breaks were designed on a progressive basis for each year of the research project. The objectives were:

1. First Year
   a. Each child (K-6 grades) ran, jogged, and/or walked a mile non-stop.
   b. Each child (K-6 grades) learned the exercises of a Vitae Park course.
   c. Each child developed an understanding of basic cardiopulmonary functions.
2. Second and Third Years
   a. Each child (4-6 grades) ran or jogged two miles non-stop.
   b. Each child (K-3 grades) ran or jogged 1.2 miles non-stop.
   c. Each child (K-6 grades) participated in activities for 20 minutes of continuous movement three days per week.
   d. Each child went through an 11 station Vitae Park course without stopping.

e. Each child (5-6 grades) recorded his/her heart rates and developed an understanding of vital capacity.

All of the objectives listed were met in accordance to the specific grade levels for which they were designed.

The Vitae Park was a set of exercise stations that covered a 1.5 mile course on the school playground. The students went through this course on a self-directed basis. The Vitae Park was also designed for adult use, therefore the children, their parents and teachers exercised together.

Fitness assessments were given at the beginning of each school year and again at the end of the school year. These assessments were of:

1. Blood Composition
   a. Cholesterol
   b. Triglycerides
   c. Hemoglobin
2. Blood Pressure
3. Heart Rate
4. Body Composition
5. Pulmonary Function
6. Modified Åstrand Rhyming Test (4-6 grades)
7. 12-Minute Run (4-6 grades)
8. 600-Yard Run (K-2 grades)

All assessments were made at the school. Parents and teachers were included.

The results and findings of the project for a two-year period of time varied to some extent. The observable attitude and behavioral changes in the students, as well as in parents and teachers, were very consistent, in that positive changes were detected in a progressive manner in each of the first two years. Some of these changes were:

1. Better attendance.
2. Fewer visits to the school nurse.
3. Better classroom behavior.
4. Changes in eating habits at school and home.
5. More students eating the school lunch. This increased from 35% to 75%.

6. Loss of weight with the children who were considered overweight.
7. A greater ability on the part or the students to talk about heart and lung functions.
8. Parents and their children developed personal fitness programs.
9. Teachers became concerned about their fitness levels. This really became evident as they taught the classroom modules on cardiopulmonary health.

The statistical findings of the project for the same period of time also varied. It seemed that grade levels were important as to whether or not there was an increase in the number of changes that occured. Statistical comparisons of data were made by grade level only. The following statistical results were significant at the .05 level of confidence.

1. First Year
   a. Systolic blood pressure in second and third grade children in the experimental school significantly decreased as compared to the second and third grade children in the control school.
   b. Cholesterol levels in second, third, and fifth grade children in the control school significantly increased as compared to second, third, and fifth grade children in the experimental school.
2. Second Year
   a. Resting heart rate in second and fifth grade children in the experimental school significantly decreased as compared to second and fifth grade children in the control school.
   b. Third, fourth, fifth, and sixth grade children in the

experimental school ran significantly farther in the 12-minute run as compared to third, fourth, fifth, and sixth grade children in the control school. Third and fourth grade children ran an average of 1.3 miles. Fifth grade children ran an average of 1.5 miles. Sixth grade children ran an average of 1.4 miles.

c. On the Modified Åstrand Rhyming Test, fifth grade children in the experimental school had significantly better results on resting heart rate, mean exercise heart rate, percentage of recovery after one minute and percentage of recovery after two minutes as compared to fifth grade children in the control school.

A three-year follow-up is currently being conducted on the subjects who were in the experimental program. This follow-up involves:

1. The development of a physical activity profile on each student.
2. The identification of nutritional habits and the development of a profile to indicate such.
3. The assessment of knowledge retained from studying the classroom modules.

The research phase of the project ended with the closing of the 1979-80 school year. Results from the third year are not available at this time.